

L Number	Hits	Search Text	DB	Time stamp
1	40102	backup with backup	USPAT; US-PGPUB	2002/10/30 15:25
4	0	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:12
7	183	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:25
10	146	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:12
13	73	sequential near5 (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:13
16	65	(sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:14
19	9481	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:32
22	13	((tier\$2 or second\$3 or more or addition\$3) with (backup with backup)) same ((sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup))	USPAT; US-PGPUB	2002/10/30 15:23
25	391	increment\$4 with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:23
28	3	(increment\$4 with (backup with backup)) same (sequential near5 (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:24
31	19667	backup with backup	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
36	33	sequential with (backup\$1 or (back-up\$1))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
41	21	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
46	1773	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:33
51	1	((backup with backup) same (sequential with (backup\$1 or (back-up\$1)))) same ((tier\$2 or second\$3 or more or addition\$3) with (backup with backup))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:40
56	14	backup adj3 again	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:41
61	87	backup adj3 again	USPAT; US-PGPUB	2002/10/30 16:53
64	8	(backup adj3 again) with data	USPAT; US-PGPUB	2002/10/30 16:45
67	1	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) adj2 (copy or copie\$1))	USPAT; US-PGPUB	2002/10/30 16:50
70	0	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) adj2 (copy or copie\$1))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:50
75	1	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) with backup\$1)	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:52
80	0	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) with backup\$1)	USPAT; US-PGPUB	2002/10/30 16:52
83	0	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two or addition\$4) with backup\$1)	USPAT; US-PGPUB	2002/10/30 16:53
86	18	(backup near3 data) near3 again	USPAT; US-PGPUB	2002/10/30 17:01
89	1	5515502.pn.	USPAT; US-PGPUB	2002/10/30 17:01

US-PAT-NO: 6216211
DOCUMENT-IDENTIFIER: US 6216211 B1

TITLE: Method and apparatus for accessing mirrored logical volumes

DATE-ISSUED: April 10, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
McBrearty; Gerald	Austin	TX	N/A	N/A
Francis	Austin	TX	N/A	N/A
Shieh; Johnny Meng-Han				

US-CL-CURRENT: 711/162; 711/163 ; 711/167

ABSTRACT:

A system and method for managing mirrored logical volumes are provided wherein a user designates one mirror of a given logical volume, having a first entry point, as the backup mirror, with a different entry point, for that logical volume; and thereafter, upon user issuance of an I/O command, appropriately valid mirror(s) are selected to be read from or written to as a function of which of the two entry points to the same data is specified.

5 Claims, 7 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

----- KWIC -----

Brief Summary Text - BSTX:

U.S. Pat. No. 5,515,502 (Wood, May 7, 1996) relates to a backup system for multiple archive devices. This is a full-blown backup system in which data that changed after backup started, are copied again.

US-PAT-NO: 5812398
DOCUMENT-IDENTIFIER: US 5812398 A

TITLE: Method and system for escrowed backup of hotelled world wide web sites

DATE-ISSUED: September 22, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Jakob	Atherton	CA	N/A	N/A

US-CL-CURRENT: 713/200; 713/164 ; 714/6

ABSTRACT:

Embodiments of the present invention provide an improved method and system for storing a backup copy of a client company's data. In the preferred embodiment, the backup of data occurs within a computer system having a host company's computer system and an escrow company's computer system. Through the teachings of the present invention, native data stored on a host computer is backed-up onto an escrow computer, even though the escrow company's computer system includes a security mechanism, such as a firewall, to prevent unauthorized access from computers outside the escrow company's computer system.

In one embodiment, the host computer stores a native copy of the data in a file. The host computer then processes the file, for example, using a computer program named "uuencode" which is found on many Unix-based computers, so as to convert the file into a format which can be emailed. Once converted, the host computer emails the file to the escrow computer. By emailing the file, the host computer is able to get the information in the file past the escrow company's firewall. The escrow computer receives the email, extracts the file from the email, and stores the file as a backup copy of the client company's data.

3 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

----- KWIC -----

Brief Summary Text - BSTX:

A third embodiment of the invention provides an improved method and system for storing multiple backup copies of data. The escrow computer system preferably stores the last three backups of the data. Backups that are more than three backup periods old are treated as follows: if the backup period for the file is a power of two (e.g, 4, 8, 16, etc.), then it continues to be stored by the escrow computer system. If the backup period is not a power of two then the file is kept if there are no other files stored with a period number greater than the file in question but smaller than the next higher power of two. Thus, if the file being considered is 6 backup periods old, it will be deleted if there is a file that is 7 periods old and kept if there is no such file. This approach ensures that there are always backup files available to restore past system states, though progressively fewer files are kept for older states (that

are less likely to need to be restored exactly).

Brief Summary Text - BSTX:

This method for maintaining backup copies of data is especially useful in an environment where a client company's web site is being maintained by an outside agency and where the outside agency uses an embodiment of the present invention for maintaining backup copies of the data. This is true because the host company may begin to forward inaccurate or corrupt backup copies of the web site to the escrow company before the host company's computers become completely inaccessible, for example, due to the host company's bankruptcy. Therefore, it is important to maintain multiple backup copies of data to ensure that an accurate copy of the website may eventually be restored.

Drawing Description Text - DRTX:

FIG. 6 illustrates the preferred steps of a method to save multiple backup copies of the client's data.

Detailed Description Text - DETX:

FIG. 6 illustrates the preferred steps of a method to save multiple backup copies of the client's data. The escrow computer saves multiple backup copies of the client's data because the host computer company may begin to send corrupted copies of the client's data before it reaches a situation (e.g., through bankruptcy) where the client's data is completely inaccessible to the client company and its users.

L Number	Hits	Search Text	DB	Time stamp
1	40102	backup with backup	USPAT; US-PGPUB	2002/10/30 15:25
4	0	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:12
7	183	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:25
10	146	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:12
13	73	sequential near5 (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:13
16	65	(sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:14
19	9481	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:32
22	13	((tier\$2 or second\$3 or more or addition\$3) with (backup with backup)) same ((sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup))	USPAT; US-PGPUB	2002/10/30 15:23
25	391	increment\$4 with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:23
28	3	(increment\$4 with (backup with backup)) same (sequential near5 (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:24
31	19667	backup with backup	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
36	33	sequential with (backup\$1 or (back-up\$1))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
41	21	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
46	1773	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:33
51	1	((backup with backup) same (sequential with (backup\$1 or (back-up\$1)))) same ((tier\$2 or second\$3 or more or addition\$3) with (backup with backup))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:40
56	14	backup adj3 again	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:41
61	87	backup adj3 again	USPAT; US-PGPUB	2002/10/30 16:42
64	8	(backup adj3 again) with data	USPAT; US-PGPUB	2002/10/30 16:45
67	1	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) adj2 (copy or copie\$1))	USPAT; US-PGPUB	2002/10/30 16:50
70	0	(backup adj3 data) near3 ((multi\$3 or plural\$3 or two) adj2 (copy or copie\$1))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 16:50

DERWENT-ACC-NO: 2001-652970
DERWENT-WEEK: 200175
COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Data backup method in electronic device, involves transferring current and previous block data to backup memory after completion of data storage in current block

PATENT-ASSIGNEE: OKI ELECTRIC IND CO LTD[OKID]

PRIORITY-DATA: 2000JP-0085547 (March 27, 2000)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 2001273195	October 5, 2001	N/A	006	G06F
012/16				
A				

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP2001273195A	N/A	2000JP-0085547	March 27, 2000

INT-CL (IPC): G06F012/00; G06F012/16

ABSTRACTED-PUB-NO: JP2001273195A

BASIC-ABSTRACT: NOVELTY - Electronic data are stored in arbitrary blocks (1-3) of a memory provided in an electronic device. During completion of data storage in blocks, the stored data in current and previous blocks are transferred to corresponding one of the backup memories (31-33) sequentially.

USE - For backing up of electronic data in electronic devices.

ADVANTAGE - By backing up each block data in two backup memories, the backup data can be protected reliably without loss or corruption.

DESCRIPTION OF DRAWING(S) - The figure shows the data backup process. (Drawing includes non-English language text).

Arbitrary blocks 1-3

Backup memories 31-33

CHOSEN-DRAWING: Dwg.4/8

TITLE-TERMS:

DATA METHOD ELECTRONIC DEVICE TRANSFER CURRENT BLOCK DATA MEMORY AFTER COMPLETE DATA STORAGE CURRENT BLOCK

DERWENT-CLASS: T01

EPI-CODES: T01-H01C4;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2001-488413

US-PAT-NO: 6175904
DOCUMENT-IDENTIFIER: US 6175904 B1

TITLE: Apparatus and method for providing a transparent disk drive back-up

DATE-ISSUED: January 16, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gunderson; Dick	Ione	CA	N/A	N/A

US-CL-CURRENT: 711/162; 711/112 ; 711/161 ; 714/3

ABSTRACT:

A method and corresponding apparatus provide a backup drive in a computer system having a CPU, a memory, an operating system executing between the CPU and the memory, and a first and second storage device. In accordance with one aspect of the invention, the method includes the steps of designating the first storage device as a primary drive and designating the second storage device as a backup drive. It further includes the step of making the backup drive appear invisible to the operating system. Preferably, the invention accomplishes this step by writing a specified value to the device identification location (address 01FE and 01FF of the boot sector). Thereafter, the invention writes data from the primary drive to the backup drive on a periodic basis, using direct basic input/output service (BIOS) calls. It will be appreciated that, since the drive is "invisible" to the operating system, that direct BIOS calls are required in order to write data to, or read data from, the backup drive. Finally, the invention includes the step of redesignating the primary drive and the backup drive upon receiving a control command. The control command could be a user initiated command, or it could be automatically generated upon error detection. For example, if the system detects a fatal error on the primary drive, it may generate a control command that prompts the invention to redesignate the primary and secondary drives. This is accomplished (basically) by rewriting the values stored in the device identifying locations, thus making the backup drive now visible to the system and the primary drive invisible.

6 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

----- KWIC -----

Detailed Description Text - DETX:

In this fashion, the software maintains information about the reliability (bad sector) status of each backup drive that is updated as frequently as the user chooses to specify. The software is flexible enough to accommodate those users whose programs and data are so critical that the integrity of the backup drives must be checked after each use, an operation which adds to the time spent in backing up data, as well as those users whose concerns require only weekly or monthly integrity checks. A means, however, is preferably provided to monitor potential drive problems and increase the frequency of integrity checks should bad sectors start to show up on a drive. Finally, in the unlikely event that a periodic integrity check (Step 27) shows that a backup file has become

corrupted in the interval since the last backup, the user is immediately alerted to perform a full disk verification on the drive in question (Step 28), followed by another backup, so that the data can again be used if necessary to restore files. as explained below.

US-PAT-NO: 6073220

DOCUMENT-IDENTIFIER: US 6073220 A

TITLE: Apparatus and method for providing a transparent disk drive back-up

DATE-ISSUED: June 6, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gunderson; Dick	Ione	CA	N/A	N/A

US-CL-CURRENT: 711/162; 711/112 ; 711/161 ; 714/3

ABSTRACT:

A method and corresponding apparatus provide a backup drive in a computer system having a CPU, a memory, an operating system executing between the CPU and the memory, and a first and second storage device. In accordance with one aspect of the invention, the method includes the steps of designating the first storage device as a primary drive and designating the second storage device as a backup drive. It further includes the step of making the backup drive appear invisible to the operating system. Preferably, the invention accomplishes this step by writing a specified value to the device identification location (address 01FE and 01FF of the boot sector). Thereafter, the invention writes data from the primary drive to the backup drive on a periodic basis, using direct basic input/output service (BIOS) calls. It will be appreciated that, since the drive is "invisible" to the operating system, that direct BIOS calls are required in order to write data to, or read data from, the backup drive. Finally, the invention includes the step of redesignating the primary drive and the backup drive upon receiving a control command. The control command could be a user initiated command, or it could be automatically generated upon error detection. For example, if the system detects a fatal error on the primary drive, it may generate a control command that prompts the invention to redesignate the primary and secondary drives. This is accomplished (basically) by rewriting the values stored in the device identifying locations, thus making the backup drive now visible to the system and the primary drive invisible.

26 Claims, 8 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

----- KWIC -----

Detailed Description Text - DETX:

In this fashion, the software maintains information about the reliability (bad sector) status of each backup drive that is updated as frequently as the user chooses to specify. The software is flexible enough to accommodate those users whose programs and data are so critical that the integrity of the backup drives must be checked after each use, an operation which adds to the time spent in backing up data, as well as those users whose concerns require only weekly or monthly integrity checks. A means, however, is preferably provided to monitor potential drive problems and increase the frequency of integrity checks should bad sectors start to show up on a drive. Finally, in the unlikely event that a periodic integrity check (Step 27) shows that a backup file has become

corrupted in the interval since the last backup, the user is immediately alerted to perform a full disk verification on the drive in question (Step 28), followed by another **backup, so that the data can again** be used if necessary to restore files, as explained below.

US-PAT-NO: 6216211
DOCUMENT-IDENTIFIER: US 6216211 B1

TITLE: Method and apparatus for accessing mirrored logical volumes

DATE-ISSUED: April 10, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
McBrearty; Gerald	Austin	TX	N/A	N/A
Francis	Austin	TX	N/A	N/A
Shieh; Johnny Meng-Han				

US-CL-CURRENT: 711/162; 711/163 ; 711/167

ABSTRACT:

A system and method for managing mirrored logical volumes are provided wherein a user designates one mirror of a given logical volume, having a first entry point, as the backup mirror, with a different entry point, for that logical volume; and thereafter, upon user issuance of an I/O command, appropriately valid mirror(s) are selected to be read from or written to as a function of which of the two entry points to the same data is specified.

5 Claims, 7 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 5

----- KWIC -----

Brief Summary Text - BSTX:

U.S. Pat. No. 5,515,502 (Wood, May 7, 1996) relates to a backup system for multiple archive devices. This is a full-blown backup system in which data that changed after backup started, are copied again.

US-PAT-NO: 6314502
DOCUMENT-IDENTIFIER: US 6314502 B1

TITLE: Method and apparatus for opportunistic queue processing

DATE-ISSUED: November 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Piersol; Kurt	Santa Cruz	CA	N/A	N/A

US-CL-CURRENT: 711/162; 709/203 ; 710/39 ; 710/52

ABSTRACT:

A method and apparatus for asynchronously sharing a networked backup device among multiple users. A series of processes opportunistically perform operations, broadcast requests for physical media based upon the operations, and provide a series of canceling and status checking interfaces for users.

26 Claims, 7 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 7

----- KWIC -----

Brief Summary Text - BSTX:

Another limitation with existing data backup systems lies within how the backup systems operate. Typically, users will request that particular data be backed up to or restored from a secondary storage media. The time required to fulfill such a request may vary depending upon the complexity of the request. If a request requires a secondary storage media different from that which is present in the backup device, the operator must first locate the appropriate secondary storage media and thereafter insert the media into the backup device. Any delays experienced may be compounded when multiple users concurrently share a single backup device, each issuing simultaneous backup or restore requests to the same device. In such a case, the requests are typically honored on a first come, first served basis. One problem with this method of data backup management is the sequential nature of which the backup and restore requests are handled. If, for instance, a user requests that data be restored from an non-locatable secondary media, subsequent user requests will be delayed until that secondary media is located and inserted into the backup device. Moreover, there will often be only one individual assigned the task of locating and inserting such secondary media.

US-PAT-NO: 6031698
DOCUMENT-IDENTIFIER: US 6031698 A

TITLE: Multiple partition tape cartridge detection means

DATE-ISSUED: February 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bar; Refael	San Diego	CA	N/A	N/A

US-CL-CURRENT: 360/134; 360/132 ; 360/72.2

ABSTRACT:

A tape cartridge has a tape detection means embedded therein. The tape detection means comprises a plurality of tape identification holes, preferably in octal 06 arrangement, and a single load point hole located about 30 inches from the nearest set of beginning of tape holes. A method of detecting a tape cartridge with a tape detection means embedded therein comprises the steps of: locating a set of beginning of tape holes; locating a load point hole that is 30 inches from the nearest set of beginning of tape holes; measuring the length of tape between the load point hole and the beginning of tape holes; if the length of tape is between 28 and 32 inches determining whether tape identification holes in octal 06 arrangement are present; and identifying the tape as a valid tape cartridge if the length of tape is between 28 and 32 inches and tape identification holes in octal 06 arrangement are present. An apparatus for detecting a tape cartridge with a tape detection means embedded therein comprises a tape identification transducer for reading and scanning for the tape detection data and a microprocessor electrically connected to the tape identification transducer for responding to signals from the transducer.

17 Claims, 10 Drawing figures

Exemplary Claim Number: 16

Number of Drawing Sheets: 8

----- KWIC -----

Detailed Description Text - DETX:

FIG. 4 is a diagram of the partitioning of the length of tape 58 contained within cartridge 11. Tape 58, like most tapes, contains a beginning of tape (BOT) region 80 and an end of tape (EOT) region 90. More significantly, tape 58 is divided between random access (RA) 82, 86 and sequential access 88 (Backup Zone) partitions. The exemplary configuration shown in FIG. 4 provides two random access partitions and one sequential access partition. However, other configurations are possible, such as a single random access partition and a single sequential access partition. A head park zone 84 is provided between each partition.

Detailed Description Text - DETX:

As noted above, tape cartridges can contain in excess of 1000 feet of tape and, consequently, a 45 foot partition is a small percentage of the total available

tape. As a result, after providing for a small random access partition, sufficient tape remains available for additional short random access partitions and a longer sequential access backup partition. As a result, a single tape is partitioned into a random access portion and a sequential access portion. The random access portion is sufficiently short in length to allow access times that perform more like a primary storage device. By contrast, the remaining tape remains sufficiently long to store the large amount of data and files necessary to perform such secondary storage functions as hard disk back-up.

US-PAT-NO: 5893119
DOCUMENT-IDENTIFIER: US 5893119 A

TITLE: Computer apparatus and method for merging system deltas

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Squibb; Mark	Republic	MO	N/A	N/A

US-CL-CURRENT: 707/203; 707/1 ; 707/100 ; 707/200 ; 707/202

ABSTRACT:

A computer apparatus and method for merging system deltas, and more particularly, to a computer apparatus and method for 1) merging a number of system deltas with a copy S of a system's files (primary input stream) to create a revised copy of a system's files (primary output stream), 2) merging a plurality of system deltas with one another to create a compiled system delta, 3) creating inverse system deltas, and 4) merging inverse system deltas as in 1) and 2), supra. The methods may be used to save, construct and/or retrieve current and historical system states. The apparatus and method may be used in conjunction with a computer backup process, version manager, or the like.

29 Claims, 12 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 10

----- KWIC -----

Brief Summary Text - BSTX:

The prior art comprises three procedures for system backup and/or version control. The first is "full copy versioning." In a full copy versioning system, a system's files are initially copied to a backup repository. Revised files are transferred to the backup repository as incremental backups. An incremental backup comprises a complete set of data for each file in the system that has been modified, copied, moved, renamed, or otherwise changed. In addition to the data of changed files, an incremental backup comprises the data of any new file. A system directory tracks which file versions in the backup repository comprise the current versions of a system's files. Full copy backup is currently the method of choice due to the fact that full and incremental backups may be saved to a sequential media (which is dramatically cheaper than seekable media).

US-PAT-NO: 5729743
DOCUMENT-IDENTIFIER: US 5729743 A

TITLE: Computer apparatus and method for merging system deltas

DATE-ISSUED: March 17, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Squibb; Mark	Republic	MO	N/A	N/A

US-CL-CURRENT: 707/203; 707/204

ABSTRACT:

A computer apparatus and method for merging system deltas, and more particularly, to a computer apparatus and method for 1) merging a number of system deltas with a copy of a system's files (primary input stream) to create a revised copy of a system's files (primary output stream), 2) merging a plurality of system deltas with one another to create a compiled system delta, 3) creating inverse system deltas, and 4) merging inverse system deltas as in 1) and 2), supra. The methods may be used to save, construct and/or retrieve current and historical system states. The apparatus and method may be used in conjunction with a computer backup process, version manager, or the like.

19 Claims, 12 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 10

----- KWIC -----

Brief Summary Text - BSTX:

The prior art comprises three procedures for system backup and/or version control. The first is "full copy versioning." In a full copy versioning system, a system's files are initially copied to a backup repository. Revised files are transferred to the backup repository as incremental backups. An incremental backup comprises a complete set of data for each file in the system that has been modified, copied, moved, renamed, or otherwise changed. In addition to the data of changed files, an incremental backup comprises the data of any new file. A system directory tracks which file versions in the backup repository comprise the current versions of a system's files. Full copy backup is currently the method of choice due to the fact that full and incremental backups may be saved to a sequential media (which is dramatically cheaper than seekable media).

US-PAT-NO: 5687375
DOCUMENT-IDENTIFIER: US 5687375 A

TITLE: Debugging of High Performance Fortran programs with backup breakpoints

DATE-ISSUED: November 11, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schwiegelshohn; Uwe	Dortmund	N/A	N/A	DE

US-CL-CURRENT: 717/129; 714/35 ; 714/38 ; 717/149

ABSTRACT:

This invention is a debugger for HPF-like languages which can be implemented on top of basically any debugger. A primary feature of the debugger is the use of backup breakpoints to generate a program status which is similar to a program status in a sequential execution of the code and the back and forth mapping between processor variables. This debugger requires some new debugging information which must be provided by the compiler. It then allows debugging from a sequential point of view.

6 Claims, 6 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 4

----- KWIC -----

Detailed Description Text - DETX:

An example of a sequentialization point and an exit point of a loop is given in FIG. 4. Because it is possible that not all processes are executing at least one iteration of the loop, it is also necessary to use additional backup breakpoints outside of the loop, while no backup breakpoints are required inside the loop. In the present example, the unique exit point is a backup breakpoint. During the execution of the program all processes will either hit a sequentialization breakpoint or they will bypass the loop and hit a backup/exit breakpoint directly. The debugger will evaluate the iteration variable and determine the process which must execute the first iteration (in sequential notation). This process is the only process which automatically continues execution. After the process has completed the execution of its iteration, i.e., it is stopped at a sequentialization point or at an exit point, the next process continues its execution. This procedure is repeated until the single active process has encountered an original breakpoint or all processes are stopped at an exit point or a backup breakpoint, which means the sequential execution of the loop is completed. In the last case, parallel execution of the program is resumed automatically. Of course the user can also stop the sequential execution of the loop at any time by simply removing all sequentialization points.

US-PAT-NO: 3736566

DOCUMENT-IDENTIFIER: US 3736566 A

TITLE: CENTRAL PROCESSING UNIT WITH HARDWARE CONTROLLED CHECKPOINT AND RETRY FACILITIES

DATE-ISSUED: May 29, 1973

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Anderson; David W.	Poughkeepsie	NY	N/A	N/A
Gustafson; Richard N.	Hyde Park	NY	N/A	N/A
Johnson; Lance H.	Poughkeepsie	NY	N/A	N/A
Sparacio; Francis J.	Poughkeepsie	NY	N/A	N/A
Tomas; William M.	Saugerties	NY	N/A	N/A
Webster; James J.	Wappingers Falls	NY	N/A	N/A

US-CL-CURRENT: 714/15; 712/228

ABSTRACT:

A data processing system with a central processing unit (CPU), main store (MS), and high speed storage (HSS) interposed between the CPU and store. The CPU has a high degree of overlap and pipelining. That is, a plurality of instructions are buffered and predecoded through several stages prior to issuance to individual execution units where further instruction and operand buffering takes place. The execution units may be highly pipelined, wherein succeeding instructions can be issued to the execution unit prior to the completion of execution of a prior instruction. Additional hardware is added providing the ability to periodically establish a checkpoint which stores a minimum amount of CPU status information to permit processing to proceed with a plurality of instructions with the ability to cause the CPU to re-establish all of the data operated on and the status at the time the checkpoint was made.

7 Claims, 12 Drawing figures

Number of Drawing Sheets: 8

----- KWIC -----

Detailed Description Text - DETX:

When the storage operation is into HSS 12, the data on the bus 51 will be gated by the control signal 53 into the storage backup registers 33. The information gated into the storage backup registers 33 will be the data and associated address of the data which is entered into portion 38 of the register. The pointer 34 is initially reset to point to location 0 of the storage backup registers 33. In response to each store signal 54 at the input of the pointer 34, the pointer 34 will be incremented and point to the next succeeding storage backup register. The storage backup registers 33 will receive, in sequential locations, the original contents and the associated addresses of main storage address locations which had been stored into since the taking of a checkpoint.

CLIPPEDIMAGE= JP405158633A

PAT-NO: JP405158633A

DOCUMENT-IDENTIFIER: JP 05158633 A

TITLE: EXTERNAL STORAGE DEVICE

PUBN-DATE: June 25, 1993

INVENTOR-INFORMATION:

NAME

HAEMORI, SHINJI

ENOMOTO, AKIHIKO

ANDO, KAZUMASA

MATSUSHITA, SATOSHI

ASSIGNEE-INFORMATION:

NAME

KAWASAKI STEEL CORP

COUNTRY

N/A

APPL-NO: JP03343882

APPL-DATE: December 2, 1991

INT-CL (IPC): G06F003/08;G06F003/06 ;G06F012/08

ABSTRACT:

PURPOSE: To back up data on an optical disk without exclusively using a controller such as a host computer nor using plural optical disk devices.

CONSTITUTION: When the data are backed up from the master optical disk to a backup optical disk, the master optical disk is loaded on an optical disk device 44 and the data on the master optical disk are read out to a data cache storage device 42. Then the master optical disk is unloaded and the backup optical disk is loaded on the optical disk device 44, and the data read out to the data cache storage device 42 are written on the backup optical disk. During the sequential backup operation, the host computer 50 can read and write data in desired addresses through a data cache control circuit 12.

COPYRIGHT: (C)1993,JPO&Japio

PAT-NO: EP001016967A2

DOCUMENT-IDENTIFIER: EP 1016967 A2

TITLE: Multiple drive failure tolerant RAID method and apparatus

PUBN-DATE: July 5, 2000

INVENTOR-INFORMATION:

NAME

WILNER, ALDEN

COUNTRY

US

ASSIGNEE-INFORMATION:

NAME

LSI LOGIC CORP

COUNTRY

US

APPL-NO: EP99125808

APPL-DATE: December 23, 1999

PRIORITY-DATA: US22452498A (December 31, 1998)

INT-CL (IPC): G06F011/10;G11B020/18

EUR-CL (EPC): H03M013/09 ; G06F011/10,G06F011/20

ABSTRACT:

A method and apparatus for providing data backup in a computer system is provided in which check information can be calculated and stored on a sequential arrangement of data drives such that the loss of a single data drive does not impair the reading or writing of information on that data drive. Should more than one data drive fail or several drives fail, data can still be resurrected by chaining back through the arrangement of drives to calculate lost information. An optimum number of drives can be determined when the known number of data drives and known number of check drives and known number of check drives associated with each data drive is known. Should a data drive fail, a system for re-establishing a new data drive out of the existing check drives can be implemented. <IMAGE>

PAT-NO: WO009101026A2

DOCUMENT-IDENTIFIER: WO 9101026 A2

TITLE: A METHOD OF OPERATING A DATA PROCESSING SYSTEM

PUBN-DATE: January 24, 1991

INVENTOR-INFORMATION:

NAME	COUNTRY
MALCOLM, PETER BRYAN	US

ASSIGNEE-INFORMATION:

NAME	COUNTRY
INTELLIGENCE QUOTIENT INT	GB

APPL-NO: GB09000997

APPL-DATE: June 28, 1990

PRIORITY-DATA: GB08915875A

US43513889A (July 11, 1989
November 13, 1989)

INT-CL (IPC): G06F015/40

EUR-CL (EPC): G06F011/20 ; G06F017/30

ABSTRACT:

CHG DATE=19990617 STATUS=O>A method of operating a data processing system, in particular a micro-computer, comprises a backup process in which a copy of every change made to a storage medium is recorded as the change occurs. Write operations for writing data to the storage medium are each preceded by a backup write operation to backup storage means, successive backup write operations being controlled so as to be stored as a sequential list in the backups storage means in the form of location blocks and data blocks to avoid the overwriting occurring in the storage medium. These backup write operations are executed at the level of the basic input/output system (BIOS) of the microcomputer in such a manner that normal use of the computer is unaffected. The method also includes a restore process in which bad sectors of a destination storage device are avoided by translating the file allocation table (FAT) and directories of the original data.

DERWENT-ACC-NO: 1991-031651
DERWENT-WEEK: 199105
COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Storage back-up system for personal computer - writes data periodically to back-up storage as sequential of write operators or software routine

INVENTOR: MALCOLM, P B

PATENT-ASSIGNEE: INTELLIGENCE QUOTIENT INT LTD[INTEN], INTELLIGENCE QUOTIENT INT LTD[INTEN]

PRIORITY-DATA: 1989GB-0015875 (July 11, 1989) , 1989GB-0025704 (November 14, 1989)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
GB 2234373 A	January 30, 1991	N/A	000	N/A
AU 633775 B	February 4, 1993	N/A	000	G06F
011/16				
US 5086502 A	February 4, 1992	N/A	000	N/A
WO 9101026 A3	February 21, 1991	N/A	000	N/A

CITED-DOCUMENTS: 2.Jnl.Ref; EP 259912 ; EP 351109

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
GB 2234373A	N/A	1989GB-0025704	November 14, 1989
AU 633775B	N/A	1990AU-0058595	June 28, 1990
AU 633775B	N/A	AU 9058595	N/A
AU 633775B	Based on	WO 9101026	N/A
US 5086502A	N/A	1989US-0435138	November 13, 1989
WO 9101026A3	N/A	1990WO-GB00997	June 28, 1990

INT-CL (IPC): G06F011/00; G06F011/14 ; G06F011/16 ; G06F012/16 ; G06F015/40

RELATED-ACC-NO: 1991-051415

ABSTRACTED-PUB-NO: GB 2234373A

BASIC-ABSTRACT: A method of operating a data processing system, in particular a micro-computer, comprises a backup process in which a copy of every change made to a storage medium is recorded as the change occurs. Write operations for writing data to the storage medium are each preceded by a backup write operation to backup storage means, successive backup write operations being controlled so as to be stored as a sequential list in the backups storage means in the form of location blocks and data blocks to avoid the overwriting occurring in the storage medium.

These backup write operations are executed at the level of the basic input/output system (BIOS) of the microcomputer in such a manner that normal use of the computer is unaffected. The method also includes a restore process in which bad sectors of a destination storage device are avoided by translating the file allocation table (FAT) and directories of the original data.

USE/ADVANTAGE - Providing copies of data stored in storage devices to guard against possibility of storage device becoming faulty or data becoming corrupted, lost or infected by computer virus. Especially concerned with provision of backups for personal computers.

ABSTRACTED-PUB-NO: US 5086502A

EQUIVALENT-ABSTRACTS: The method of operating a data processing system, in particular a micro-computer, comprises a backup process in which a copy of every change made to a storage medium is recorded as the change occurs. Write operations for writing data to the storage medium are each preceded by a backup write operation to backup storage means, successive backup write operations being controlled so as to be stored as a sequential list in the backup storage means in the form of location blocks and data blocks to avoid the overwriting occurring in the storage medium. These backup write operations are executed at the level of the basic input/output system (BIOS) of the microcomputer in such a manner that normal use of the computer is unaffected.

The method also includes a restore process in which bad sectors of a destination storage device are avoided by translating the file allocation table (FAT) and directories of the original data.

USE - To provide copies of data stored in memory to guard against e.g. computer virus. @ (11pp)@

CHOSEN-DRAWING: Dwg.4/5

TITLE-TERMS:

STORAGE BACK UP SYSTEM PERSON COMPUTER WRITING DATA PERIOD BACK UP STORAGE
SEQUENCE WRITING OPERATE SOFTWARE ROUTINE

DERWENT-CLASS: T01

EPI-CODES: T01-F05; T01-H01C;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N1991-024474

L Number	Hits	Search Text	DB	Time stamp
1	40102	backup with backup	USPAT; US-PGPUB	2002/10/30 15:25
4	0	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:12
7	183	sequential with (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:25
10	146	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:12
13	73	sequential near5 (backup\$1 or (back-up\$1))	USPAT; US-PGPUB	2002/10/30 15:13
16	65	(sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:14
19	9481	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:32
22	13	((tier\$2 or second\$3 or more or addition\$3) with (backup with backup)) same ((sequential near5 (backup\$1 or (back-up\$1))) same (backup with backup))	USPAT; US-PGPUB	2002/10/30 15:23
25	391	increment\$4 with (backup with backup)	USPAT; US-PGPUB	2002/10/30 15:23
28	3	(increment\$4 with (backup with backup)) same (sequential near5 (backup\$1 or (back-up\$1)))	USPAT; US-PGPUB	2002/10/30 15:24
31	19667	backup with backup	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
36	33	sequential with (backup\$1 or (back-up\$1))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
41	21	(backup with backup) same (sequential with (backup\$1 or (back-up\$1)))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:25
46	1773	(tier\$2 or second\$3 or more or addition\$3) with (backup with backup)	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:33
51	1	((backup with backup) same (sequential with (backup\$1 or (back-up\$1)))) same ((tier\$2 or second\$3 or more or addition\$3) with (backup with backup))	EPO; JPO; DERWENT; IBM_TDB	2002/10/30 15:33